

an anastomosis device applicator for deploying the anastomosis device, the anastomosis device applicator connected to the vessel penetrating member.

31. The system of Claim 30, wherein the anastomosis device applicator includes two tubes movable with respect to one another to deploy the anastomosis device.

32. The system of Claim 30, wherein the tubular anastomosis device is a one-piece tubular anastomosis device.

33. The system of Claim 32, wherein the tubular anastomosis device and anastomosis device applicator are configured for eversion of the end of the graft vessel over the tubular anastomosis device.

34. The system of Claim 30, wherein the vessel penetrating member is positioned inside the anastomosis device applicator.

35. The system of Claim 30, wherein the tubular anastomosis device is configured to be inserted through a penetration formed by the penetrating member.

36. An anastomosis tool for deploying an anastomosis device to connect a graft vessel to a target vessel, the tool comprising:

- a first tube configured to receive an anastomosis device;
- a second tube concentric with the first tube, the first and second tube movable with respect to one another to deploy the anastomosis device; and
- a side hole in at least one of the first and second tubes configured to allow the graft vessel to pass out of the side of the tube.

37. The anastomosis tool of Claim 36, wherein the second tube is rotatable with respect to the first tube.

38. The anastomosis tool of Claim 36, wherein the second tube is translatable with respect to the first tube.

39. The anastomosis tool of Claim 36, wherein the second tube is rotatable and translatable with respect to the first tube.

40. The anastomosis tool of Claim 36, wherein the first tube is removably connectable to an anastomosis device.

41. The anastomosis tool of Claim 36, further comprising a handle connected to the first and second tubes with a mechanism for deploying the anastomosis device.

42. The anastomosis tool of Claim 36, in combination with an anastomosis device, wherein the first tube includes a plurality of connecting members at a distal end thereof and the anastomosis device includes a plurality of features arranged to removably connect to the plurality of connecting members.

43. A method of performing anastomosis between a graft vessel and a target vessel, the method comprising:

inserting an anastomosis device with a graft vessel connected thereto at least partly into a target vessel;

deploying a first flange of the anastomosis device within the target vessel;

moving the deployed first flange of the anastomosis device with the connected graft vessel into contact with an inner wall of the target vessel; and then

deploying a second flange of the anastomosis device outside of the target vessel.

44. The method of Claim 43, wherein the deploying step connects an end of the graft vessel to a side of the target vessel.

45. The method of Claim 43, wherein the first flange and the second flange of the anastomosis device are deployed by an anastomosis device applicator.

46. The method of Claim 43, wherein the steps of deploying of the first flange and deploying the second flange are both performed by actuation of a handle of the anastomosis device applicator.

47. The method of Claim 46, wherein the actuation of the handle is performed manually.

48. The method of Claim 46, wherein the actuation of the handle is performed in a step wise manner.

49. The method of Claim 43, wherein the step of inserting the anastomosis device includes inserting a one-piece continuous ring anastomosis device.

50. The method of Claim 49, further comprising a step of everting the graft vessel over at least a portion of the anastomosis device before inserting the anastomosis device.

51. An anastomosis device for connecting an end of a graft vessel to a side of a target vessel, the anastomosis device comprising:

a one-piece continuous body expandable from a reduced insertion profile to an expanded connecting profile; and

a plurality of graft vessel penetrating elements attached to the body and configured to penetrate the graft vessel without penetrating the target vessel.

52. The device of Claim 51, wherein the one-piece continuous body is formed of a superelastic or pseudoeleastic material.

53. The device of Claim 52, wherein the one-piece continuous body is formed of NiTi alloy.

54. The device of Claim 51, wherein body in the expanded connecting profile forms a flange at an interior of the target vessel wall.

55. The device of Claim 54, further comprising an outer flange connectable to the body and configured to abut an exterior of the target vessel wall.

56. An anastomosis tool for use in connecting an end of a graft vessel to a side of a target vessel, the tool including a vessel penetrating member configured to penetrate the target vessel, wherein the tool penetrates the target vessel and delivers a one-piece anastomosis device to connect the graft vessel and the target vessel.

57. The anastomosis tool of Claim 56, wherein the anastomosis tool includes concentric tubes for deploying the one-piece anastomosis device.

58. The anastomosis tool of Claim 57, wherein the concentric tubes are movable with respect to one another to deploy the one-piece anastomosis device.

59. The anastomosis tool of Claim 56, wherein the vessel penetrating member is positioned inside the concentric tubes.

60. A method of performing anastomosis between a graft vessel and a target vessel, the method comprising:

receiving an anastomosis device on an anastomosis device applicator having a vessel penetrating member;

connecting a graft vessel to the anastomosis device on the anastomosis device applicator;

penetrating a target vessel with the vessel penetrating member of the anastomosis device applicator;

advancing the anastomosis device into the penetration in the target vessel;  
and

deploying the anastomosis device with the anastomosis device applicator to connect the graft vessel to the target vessel.

61. The method of Claim 60, wherein the step of deploying the anastomosis device is performed by moving two tubes of the anastomosis device applicator with respect to one another to deploy the anastomosis device.

62. The method of Claim 60, wherein the anastomosis device is a one-piece anastomosis device.

63. The method of Claim 60, wherein during the penetrating step the vessel penetrating member is positioned inside the anastomosis device applicator.

64. The method of Claim 60, wherein the step of deploying connects an end of the graft vessel to a side of the target vessel.

65. A method of performing anastomosis between a graft vessel and a target vessel, the method comprising:

receiving an anastomosis device on an anastomosis device applicator including a first tube and a second tube;

connecting a graft vessel to the anastomosis device on the anastomosis device applicator with an end of the graft vessel passing out a side hole of at least one of the first and second tubes; and

deploying the anastomosis device with the anastomosis device applicator to connect the graft vessel to the target vessel.

66. The method of Claim 65, wherein the step of deploying the anastomosis device is performed by moving the first and second tubes with respect to one another.

67. The method of Claim 65, wherein the step of receiving the anastomosis device on the anastomosis device applicator is performed by removably connecting a plurality of features of the anastomosis device to a plurality of connecting members at a distal end of the first tube.

68. An anastomosis device for connecting an end of a graft vessel to a side of a target vessel, the anastomosis device comprising:

a body having a longitudinal axis, an open proximal end, and an open distal end;

at least two deployable sections on the body, the deployable sections each having a pre-deployed configuration for insertion into the target vessel and a deployed configuration for connecting the graft vessel to the target vessel, wherein the anastomosis device is configured to collapse longitudinally when deployed.

69. The device of Claim 68, wherein the anastomosis device is configured to be longitudinally collapsed to a greater or lesser degree to position the deployable sections at a desired location.